PROC. ENTOMOL. SOC. WASH.
99(3), 1997, pp. 583–584

NOTE

# *Acoptus suturalis* LeConte (Coleoptera: Curculionidae: Zygopinae), a Potential Vector of the Chestnut Blight Fungus, *Cryphonectria parasitica* (Murrill) Barr, in the Eastern United States

American chestnuts trees, *Castanea dentata* (Marshall) Borkhausen, were once a widespread and important component of forests throughout the eastern United States. Following the introduction of the chestnut blight fungus, *Cryphonectria parasitica* (Murrill) Barr, into this country early in the century there was a rapid and dramatic decline in the abundance of these trees (Anagnostakis 1994. Advances in Botanical Research 21: 125–145). In an attempt to reestablish this species in forests and orchards there has been an exhaustive search for blight-resistant tree strains by cross-breeding with other species of *Castanea* (Anagnostakis 1994). More recent studies suggest that infected chestnuts inoculated with certain hypovirulent strains of the fungus are less susceptible to severe canker-induced damage (Anagnostakis 1994). Hypovirulence, caused by infection of the fungus with a double-stranded RNA virus or hypovirus, reduces the fungus damage to trees. Transgenic fungal strains have been produced that have a cDNA copy of the Hypovirus genome integrated into the genome of the blight fungus (Choi and Nuss 1992. Science 257: 800–803). These hypovirulent strains have the potential to effect a stable biological control of chestnut blight.

Dissemination of these hypovirulent strains outside the area of test plots will depend upon naturally occurring dispersal agents. Since insects, and particularly beetles, are known to harbor hypovirulent strains (Russin et al. 1984. Journal of Economic Entomology 77: 838–846) we were interested to find large numbers of the weevil *Acoptus suturalis* LeConte (Coleoptera: Curculionidae: Zygopinae) feeding upon chestnut cankers in an experimental plot (150 m × 80 m) in the Housatonic State Forest (Sharon township, Litchfield county, 73 22 30W × 41 52 40N, elevation 395 m) in northwestern Connecticut. In this forest test plot, pairs of American chestnut trees, AB to WX, were used in a study of the effect of virulent strains of the blight fungus. The first tree of each pair was treated with a transgenic hypovirulent strain, with resistance to hygromycin as an additional marker.

The vast majority of curculionids feed upon the living tissue of diverse structures of plants, although a considerable number are associated with decaying wood or fungi. Little is known about the feeding associations for zygopine weevils, although adults are often found in the vicinity of rotting wood, so the presumption is that the larvae develop in this habitat (Hespenheide 1995. Memoirs of the Entomological Society of Washington 14: 145–154). Lyal (1986. Journal of Natural History 20: 789–798) observed species of mecopine and metialmine Zygopinae ovipositing in the bark of fallen trees in southeastern Asia. The zygopine weevil *Acoptus* LeConte, a monotypic genus, is represented by *A. suturalis* and is widely distributed in eastern North America. Adults of this species have been taken from *Quercus* sp., *Cercis canadensis* L., *Carya* sp., and *Platanus occidentalis* L. (Sleeper 1963. Bulletin of the Southern California Academy of Sciences 62(4): 209–220), and from chestnut (Russin et al. 1984). Additionally, Chittenden (1890. Entomologica Americana 6: 167–172) reported *Acoptus suturalis* adults and supposedly conspecific larvae living in the dead wood of beech trees (*Fagus* sp.).

Fig. 1. *Acoptus suturalis* feeding on chestnut blight cankers infected with a hypovirulent transgenic strain of *Cryphonectria parasitica*.

*Acoptus suturalis* weevils were observed in Connecticut grazing on the fungal stromata in the *Cryphonectria parasitica* cankers on American chestnut trees (Fig. 1) in the test plot which is surrounded by oak-chestnut forest. These weevels were not observed on other woody plants in the plot. Trees in the overstory are *Quercus coccinea* Muench., *Acer rubrum* L. and *Populus* sp., while woody plants in the understory include *Carya glabra* (Miller) Sweet, *Quercus prinus* L., *Acer pennsylvanicum* L., *Hamamelis virginiana* L. and an *Ulmus* sp. One of us (SLA) collected 36 weevils (although many others were observed in the test plot), surface sterilized them with a 10% bleach solution, and squashed and spread them on water agar. Of 280 fungal isolates, 13 were hygromycin resistant, indicating that they contain transgenic DNA. These observations suggest that *Acoptus* weevils may play a role in controlling chestnut blight in eastern North America since the abundance of these weevils in test plots suggests their potential for spreading a transgenic hypovirulent strain which may eventually help to control chestnut blight.

Acknowledgments.—We are indebted to Henry A. Hespenheide (University of California, Los Angeles) for information about zygopine weevil biology and some relevant literature. We thank Horace R. Burke (Texas A & M University), Joseph V. McHugh (University of Georgia), P. Sletten and J. Shepard (The Connecticut Agricultural Experimental Station, New Haven), and Allen L. Norrbom (Systematic Entomology Laboratory) for reviewing this manuscript. This research was supported, in part, with funds from the Cooperative State Research, Education, and Extension Service, U. S. Department of Agriculture, under agreement No. 95-37312-1638.

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